



## Vertical Cuttings Dryer GNCD930



HEBEI GN SOLIDS CONTROL CO.,LTD

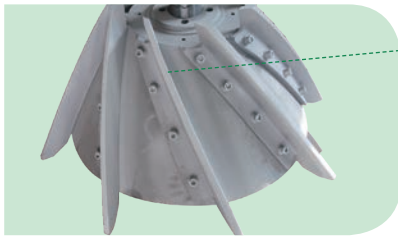


## GN Vertical Cuttings Dryer Specification

| Model                    | GNCD930E                | GNCD930E-VFD         |
|--------------------------|-------------------------|----------------------|
| Capacity                 | 30~50 Tons/H            |                      |
| Drying Efficiency        | OOC ≤ 5%                |                      |
| Screen Max Diameter      | 930mm                   |                      |
| Screen Opening           | 0.25/0.35/0.5mm         |                      |
| Rotation Speed           | 900RPM                  | 0~900RPM             |
| G Force                  | 420G                    | 0~420G               |
| Oil Tank Capacity        | 48L                     |                      |
| Air Knife Input Pressure | 0.69Mpa                 |                      |
| Air Knife Input Capacity | 1.8m3/m                 |                      |
| Main Motor               | 55Kw (75HP)             |                      |
| Oil Pump Motor           | 0.55Kw (0.75HP)         |                      |
| Flushing Pump Size       | 4Kw (5.5HP) Optional    |                      |
| EX Proof Standard        | ExdIIBt4 / IEC EX/ ATEX |                      |
| Electric Cabinet Type    | Exd                     | Positive Pressurized |
| Weight Control           | 4200Kg                  | 4200Kg               |
| Dimension: L×W×H         | 2634x1672x1728mm        |                      |

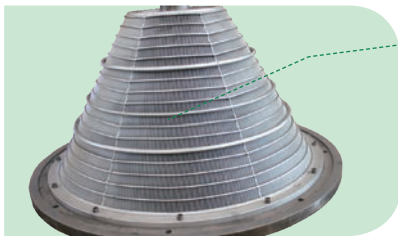
## GN Vertical Cuttings Dryer Features

|                  |                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| More Application | GN Vertical Cuttings Dryer specially designed for treating drilling cuttings discharged from Oil based Mud (OBM) and Synthetic-based Mud (SBM).                                 |
| High G Force     | GN normal vertical cuttings dryer speed is 900 RPM with Gforce up to 420 G, the VFD drive is available for adjusting the rotation speed to maximize the performance of the VCD. |
| Bearing          | FAG Brand premium bearing.                                                                                                                                                      |



- The Flights on the rotor is hard facing to HRC 65, longer life than our competitors.

The flights and the rotor assembly is individually balanced for future replacement.



- Specially designed highly precise stainless steel screen to ensure your better separation, longer life and easy replacement.

The screen itself is individually balanced for future replacement. And the screen is separated from the frame which allows you to change the screen only, not need to change the frame inside.



- Special high pressure air knife design to clean the basket screen automatically to avoid the screen blinding especially for high viscosity mud and water based mud.

- All around flushing system through specially designed nozzle to avoid the block of the liquid discharge channel.



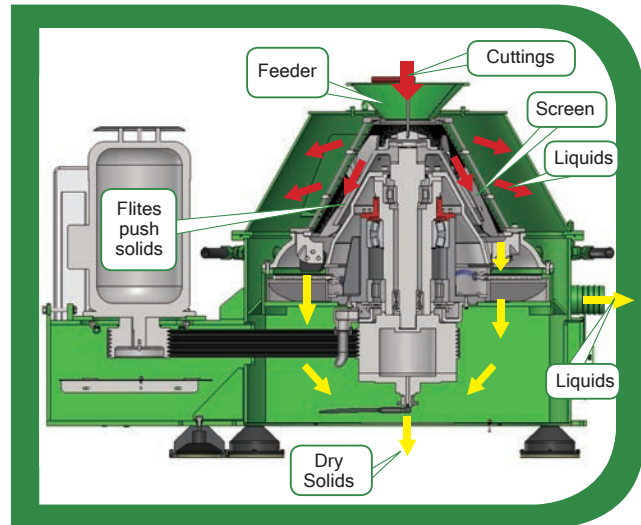
- Individual oil lubrication system with automatic alarm for pressure limit. The main motor and oil pump motor is interlocked with each other for avoiding the start of the main motor prior to the start of the oil pump motor.



- GN VFD cuttings dryer control panel is made of stainless steel with Pressurized explosion proof. The PLC smart control allows you to adjust the speed and protect the machine more friendly. The air circulation through the cooling tubes allow you to use the VFD cuttings dryer in high temperature environment. The VFD is ABB or SIEMENS Brand, other main electric components are Schneider or SIEMENS Brand.

## GN Vertical Cuttings Dryer Working Principle

The GN Vertical Cuttings Dryer uses centrifugal force to dry drilled solids in oil or synthetic basefluids. A stainless steel screen bowl traps “wet” solids and accelerates them up 900RPM with G force to 420G. Liquid is forced through the screen bowl openings, while “dry” solids are extracted by the angled flights attached to the cone, which rotate slightly slower than the bowl. Tungsten carbide protects the flights from abrasive solids and ensures long operational life. This aids in maintaining a constant gap between the scroll and screen bowl, which is crucial for proper operation.

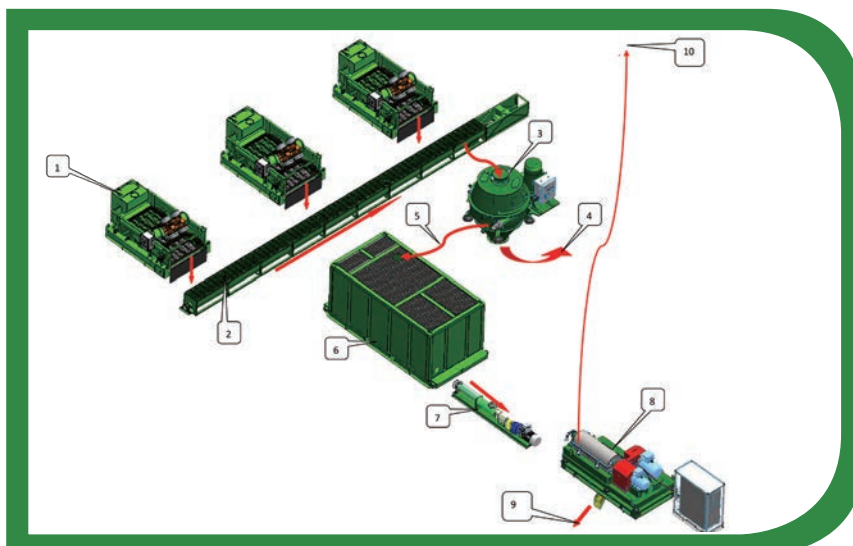


## GN Vertical Cuttings Dryer Application

GNCD930 Vertical Cuttings Dryer is used for taking drilling fluids from the drilling cuttings. It is to maximize the recycling of drilling fluids, and minimize the drilling waste in order to save cost for operators.

- 1) For oil based drilling cuttings, normally it can reduce the oil on the cuttings to 3% to 5%.
- 2) For water based drilling cuttings, normally it can reduce the moisture content to very low which is easier for transport.
- 3) Recycling drilling fluids for reuse to save cost .
- 4) Reduce the drilling waste quantity to save money on the disposal or further treatment.

## Process of the treatment of the drilling cuttings



- 1- Shale Shaker
- 2- Auger Conveyor
- 3- Vertical Cuttings Dryer
- 4- Drying Cuttings Discharge
- 5- Recycled Drilling Fluids
- 6- Catching Tank
- 7- Centrifuge Feed Pump
- 8- Centrifuge
- 9- Solids Discharged
- 10- Clean fluids goes back to active mud system

The drilling cuttings discharged from desander or desilter and centrifuge are not recommended to feed to the vertical cuttings dryer.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| A) Feed System                          | Size, shape, volume and moisture content of drilled solids can vary greatly. Installing a proper delivery system to deal with the range and volume of material is critical. Normally delivery systems including                                                                                                                                                                                                                       | • A variety of screw conveyors and chutes |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                       | • Vacuum transfer systems                 |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                       | • Positive pressure transfer systems      |
| B) GN Vertical Cuttings Dryer           | The GN Vertical Cuttings Dryer processes drilled cuttings to between 3% to 5% wet weight oil. The Dryer has comfortably processed cuttings generated when drilling reached 150 feet per hour in 20-inch hole (46 meters per hour in 508-mm hole).                                                                                                                                                                                     |                                           |
| C) “Dry” Solids Discharge or Collection | A screw conveyor is usually installed beneath the Vertical Dryer and collects the “dry” solids, which are sent overboard if regulations allow, or are collected for final disposal off-site.                                                                                                                                                                                                                                          |                                           |
| D) Effluent Polishing                   | The Cuttings Dryer effluent is typically collected and pumped to a high-volume decanting centrifuge for further cleaning. The decanting centrifuge separates the slurry into fine solids and “cleaned” fluid, which is often sent back to the active drilling fluid system. A portion may be used as dilution for the Dryer. The solids from the centrifuge can be collected in the same vessel or conveyor as solids from the Dryer. |                                           |

## Performance of GN Vertical Cuttings Dryer

Videos: <http://www.gnsolidscontrol.com/drilling-video/>

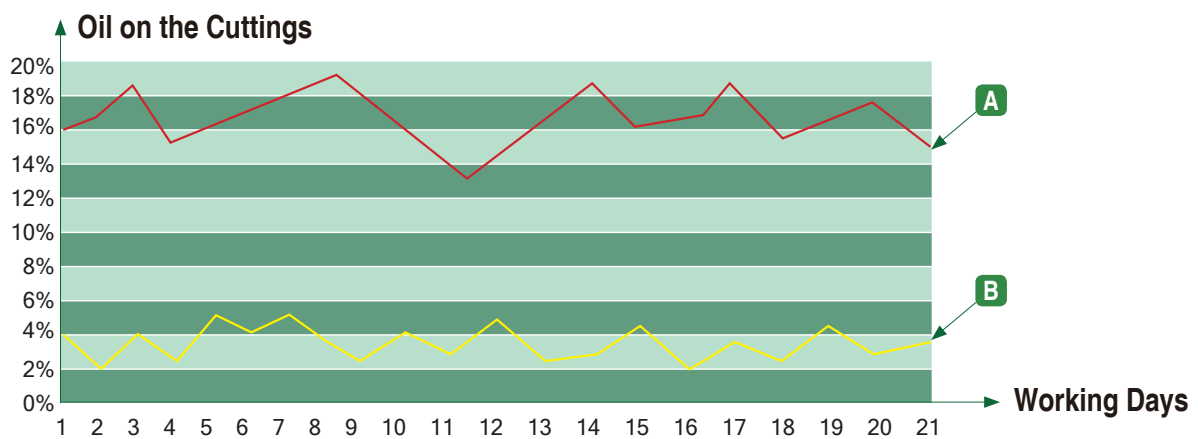


● OBM Before treatment



● After treatment, Oil on the Cutting: 2.9%

## Operation Record



A Oil on the cuttings before treatment.

B Oil on the cuttings for the drilling cuttings discharged from GN Vertical Cuttings Dryer.

## GN Vertical Cuttings Dryer Case Study



GN Vertical Cuttings Dryer can be mounted on the telescopic skid or on the skid together with the decanter centrifuge for fast movement.

## Case Study



● Greatwall Drilling Shell Project in China



● Europe Cyprus Project



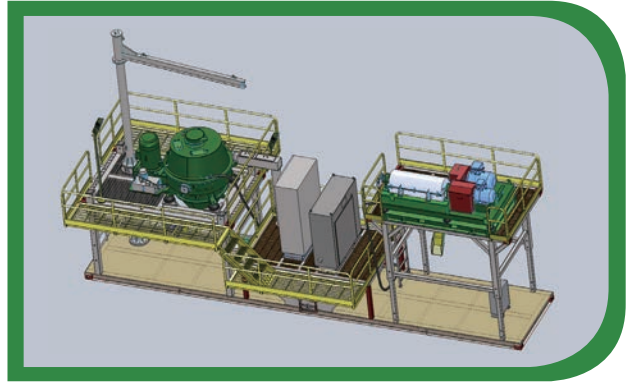
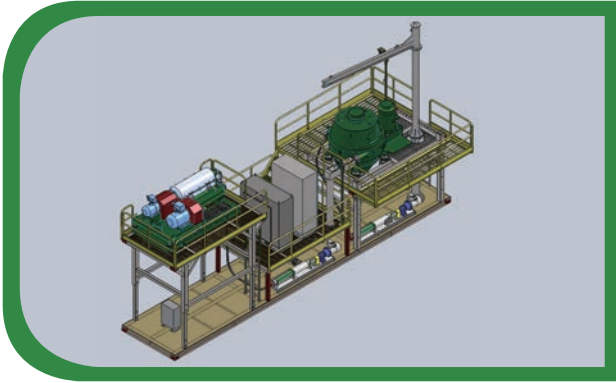
● Africa Ghana Project



● Russia Project

GN Solids Control focus on the solids control equipment, and the RD of innovative products for the drilling waste management. GN Solids Control has been widely known as a top Brand in the international market. GN Solids Control Sold over 50 cuttings dryers and over 150 decanter centrifuges in 2014. And this number continues to grow every year because of it's quality and good performance.

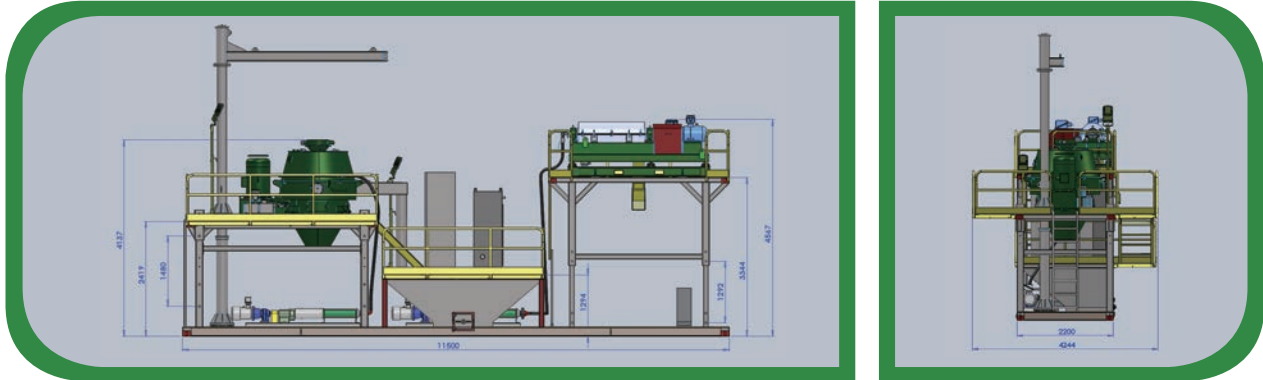
## GNCM-40A Standard Drilling Cuttings Management System



### GNCM-40A Equipment List

| S/N | Name                    | Description                                                                                                                                                                                                                                                                                                                                                                |
|-----|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Vertical Cuttings Dryer | GNCD930 with option for VFD or fixed speed.                                                                                                                                                                                                                                                                                                                                |
| 2   | Decanter Centrifuge     | GNLW363 centrifuge 14inch bowl, Optional model as below: <ul style="list-style-type: none"> <li>• GNLW363CG Premium Centrifuge with fixed speed.</li> <li>• GNLW363CG-VFD Premium Centrifuge with VFD drive.</li> <li>• GNLW363CD Economic Standard with fixed speed.</li> <li>• GNLW363CD-VFD Economic Standard with VFD drive.</li> </ul>                                |
| 3   | Screw Pump              | Two sets GNG30A-075 Screw Pump with capacity: 30m <sup>3</sup> /h for each pump. One for taking fluids from catching tank to feed the decanter centrifuge, the other one for flushing the Vertical Dryer.                                                                                                                                                                  |
| 4   | Skid with catching tank | Fast move Skid for mounting all the equipment<br>One Catching tank with capacity:4m <sup>3</sup> for catching fluids from vertical cuttings dryer.                                                                                                                                                                                                                         |
| 5   | Telescopic Skid         | Two telescopic skid with walkways and handrails for safe operation.<br>One for mounting the decanter centrifuge to a higher position in order to allow the centrifuge discharged fluids feed to active mud system by gravity.<br>The other telescopic skid for mounting and adjusting the height of the vertical cuttings dryer to allow the discharge of drying cuttings. |
| 6   | Electric Cradle         | 0.5 Tons electric cradle for lifting the component of vertical dryer.                                                                                                                                                                                                                                                                                                      |
| 7   | Electrical System       | Two lighting systems, electrical control boxes and cables and plugs for operation the complete system.                                                                                                                                                                                                                                                                     |

## GNCM-40A Drilling Cuttings Management System Dimensional Drawing



### Complete Package Total Weight Around: 18.5 Tons (Including all equipment)

#### 1) Tank Skid Dimension: 11500x2200x2052mm

This dimension fit for putting inside the 40FT container after removing centrifuge and cuttings dryer for shipping by sea.

#### 2) Land Transportation Dimension: 11500x2300x3300mm

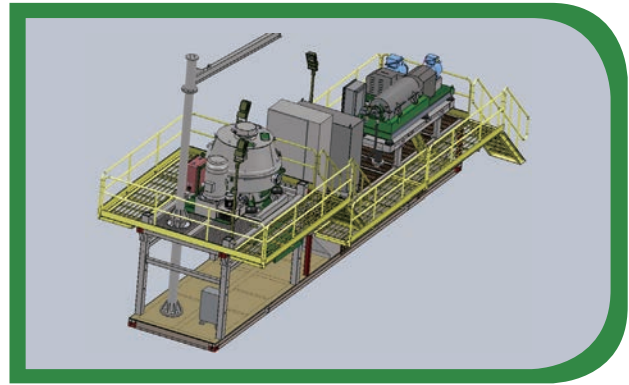
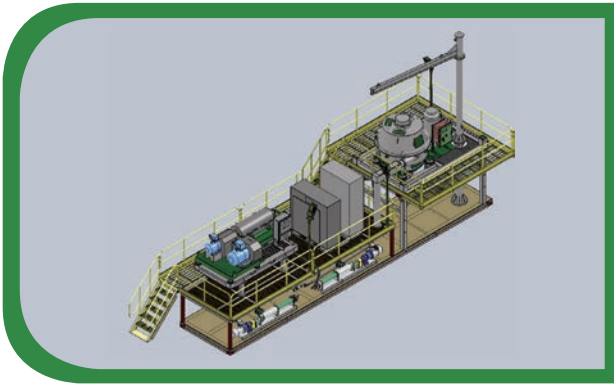
Lower the centrifuge and cuttings dryer to the low position while moving by trucks, this dimension fit for land transportation fast move completed package without removing centrifuge and cuttings dryer from the skid.

#### 3) Operation Dimension: 11500x4244x4567mm

This layout allows the drying solids discharge from the vertical cuttings dryer, and also allows the fluids discharged from the centrifuge goes to active/storage mud tank by gravity without transfer pump.



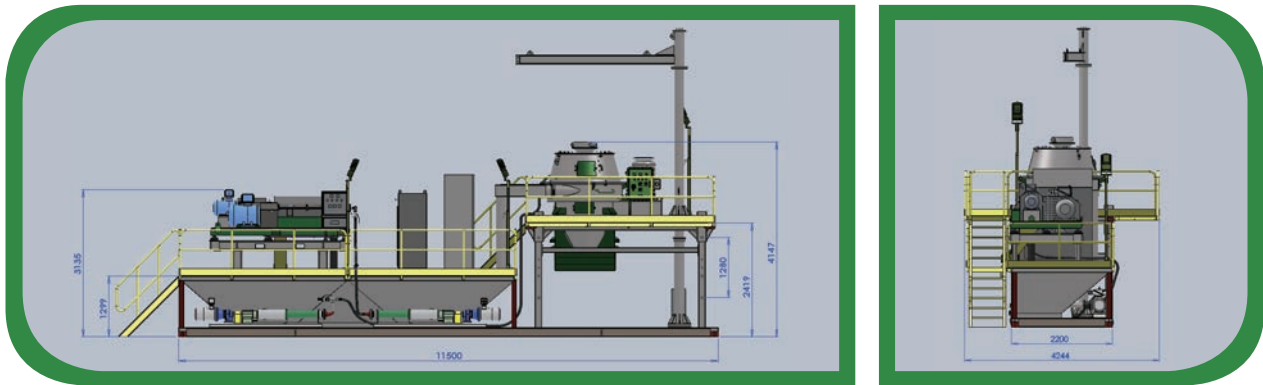
## GNCM-40B Standard Drilling Cuttings Management System



### GNCM-40B Equipment List

| S/N | Name                    | Description                                                                                                                                                                                                                                                                                                                                     |
|-----|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Vertical Cuttings Dryer | GNCD930 with option for VFD or fixed speed.                                                                                                                                                                                                                                                                                                     |
| 2   | Decanter Centrifuge     | GNLW363 centrifuge 14 inch bowl, Optional model as below:<br><ul style="list-style-type: none"> <li>• GNLW363CG Premium Centrifuge with fixed speed.</li> <li>• GNLW363CG-VFD Premium Centrifuge with VFD drive.</li> <li>• GNLW363CD Economic Standard with fixed speed.</li> <li>• GNLW363CD-VFD Economic Standard with VFD drive.</li> </ul> |
| 3   | Screw Pump              | Two sets GNG30A-075 Screw Pump with capacity: 30m <sup>3</sup> /h for each pump. One for taking fluids from catching tank to feed the decanter centrifuge, the other one for flushing the Vertical Dryer.                                                                                                                                       |
| 4   | Skid with catching tank | Fast move Skid for mounting all the equipment<br>Two Catching tanks, one catching tank with capacity: 4m <sup>3</sup> for catching fluids from the vertical dryer, the other catching tank with capacity 4m <sup>3</sup> for catching fluids from the centrifuge.                                                                               |
| 5   | Telescopic Skid         | One telescopic skid with walkways and handrails mounting and adjusting the height of the vertical cuttings dryer to allow the discharge of drying cuttings.                                                                                                                                                                                     |
| 6   | Electric Cradle         | 0.5 Tons electric cradle for lifting the component of vertical dryer.                                                                                                                                                                                                                                                                           |
| 7   | Electrical System       | Two lighting systems, electrical control boxes and cables and plugs for operation the complete system.                                                                                                                                                                                                                                          |

## GNCM-40B Drilling Cuttings Management System Dimensional Drawing



**Complete Package Total Weight Around:20.5 Tons (Including all equipment)**

### 1) Tank Skid Dimension:11500x2200x1299mm

This dimension fit for putting inside the 40FT container after removing centrifuge and cuttings dryer for shipping by sea.

### 2) Land Transportation Dimension:11500x2300x3135mm

Lower the vertical cuttings dryer to the low position while moving by trucks, this dimension fit for land transportation fast move completed package without removing centrifuge and cuttings dryer from the skid.

### 3) Operation Dimension:11500x4244x4147mm

This layout allows the drying solids discharge from the vertical cuttings dryer, the fluids discharged from the centrifuge will stock in the catching tank below, and it needs the pump to transfer the fluids to other storage tanks.

### Difference between GNCM-40A And GNCM-40B

The GNCM-40A and GNCM-40B are two different designed drilling cuttings management systems fit for different clients.

The major difference is the set up of the decanter centrifuge, the centrifuge on GNCM-40A is set up on a telescopic skid with height adjustable. The advantage of this design is to allow the fluids discharged from the centrifuge to flow to the storage tank or active mud tank by gravity. But when move the complete system by truck, the telescopic skid should be lower down, and there is no storage capacity for the catching fluids from centrifuge.

The centrifuge on the GNCM-40B system is set up on the catching tank, the advantage of this design is to allow the fluids discharged from centrifuge to the under stream catching tank and also, operators do not need to lower down the centrifuge in land transportation. But it needs a transfer pump to transfer fluids discharged from the centrifuge in the catching tank to storage tank or active mud system.



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